



ECMC OPERATOR GUIDANCE

RULE 802: Aquifer Exemption Evaluation

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Introduction:

Through rule 802 (Appendix A below) and in coordination with Colorado Department of Public Health and Environment Water Quality Control Division (WQCD), Colorado Department of Natural Resources Division Water Resource (DWR) and US Environmental Protection Agency (EPA), the Commission specifies that an exempt aquifer^{1,2} cannot be classified for domestic or agricultural use by the WQCD. In determining that a formation cannot serve as a current or future source of drinking or agricultural water because it is a hydrocarbon-bearing formation, will be used for disposal of Class II Exploration and Production waste, or used as an injection zone in an enhanced recovery project, the Commission requires applicants to demonstrate that a formation is currently infeasible to technologically develop as a source of drinking water or can be used to commercially produce hydrocarbons or geothermal energy. The Commission does not apply a maximum depth limit or salinity level for water that could be used for drinking water or agricultural purposes. Instead, the Commission requires an applicant to demonstrate that a proposed Underground Injection Control (UIC) Exempt Aquifer cannot now or in the future serve as a source of drinking or agricultural water pursuant to the WQCD's groundwater standards and classification, because it is a mineral, hydrocarbon, or geothermal energy producing formation, or is so contaminated that it would be economically or technologically impractical to render the water fit for agricultural use.

¹ 40 CFR § 146.3 – Definitions “Exempted aquifer means an aquifer or its portion that meets the criteria in the definition of “underground source of drinking water” but which has been exempted according to the procedures of § 144.8(b).”

² 40 CFR § 146.4 - Criteria for exempted aquifers: Under Federal Regulations all groundwater from the surface to center of the earth is considered to be an aquifer making it suitable for drinking or agriculture. When groundwater has characteristics as discussed here, chemical (usually high salt or Total Dissolved Solid-“TDS”) content, hydrocarbons, or geothermal potential then it may be “exempted” from the Federal rules. If “exempted” a groundwater body becomes an “exempt aquifer”.

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To determine which formations produce geothermal energy or have geothermal energy production potential, the Commission intends for operators to use the Colorado Geological Survey's database of geothermal energy producing areas.

To provide additional clarity and guidelines about the UIC Aquifer Exemption requirements, the Commission added a definition of "UIC Aquifer" to its 100 Series Rules. The 100 Series definition of "UIC Aquifer" is identical to EPA's definition of an "aquifer" in the agency's Safe Drinking Water Act (SDWA) implementing regulations (40 C.F.R. § 149.2). Because ECMC is exercising delegated authority to implement the SDWA, the Commission determined that it is necessary to use the same definition of an "aquifer" as EPA for purposes of identifying which aquifers may be subject to the UIC Aquifer Exemption.

Aquifer Exemption Requirements

1. Retrieve water sample(s) for analysis from the injection zone(s) before stimulating formation. Water samples shall comply with Rules 909.j. Operators shall submit all water quality analysis data for the UIC facility using a Form 43, Analytical Sample Submittal.

The water sample will be analyzed for the following:

- A. pH;
 - B. Specific conductance;
 - C. Total dissolved and suspended solids (TDS and TSS);
 - D. Alkalinity (total, bicarbonate, and carbonate as CaCO₃);
 - E. Major anions (bromide, chloride, fluoride, sulfate, nitrate and nitrite as N, and phosphorus);
 - F. Major cations (calcium, iron, magnesium, manganese, potassium, and sodium);
 - G. Other elements (barium, boron, selenium, and strontium);
 - H. Naphthalene;
 - I. Total petroleum hydrocarbons ("TPH") as total volatile hydrocarbons (C6 to C10) and total extractable hydrocarbons (C10 to C36);
 - J. BTEX compounds (benzene, toluene, ethylbenzene, and xylenes); and
 - K. Radium (226Ra and 228Ra).
2. Submit the Aquifer Exemption Request that contains the following information:
 - a. A letter requesting Aquifer Exemption in accordance with ECMC rule 802 that mentions the aquifer name, location of the injection well and facility,

depth of the injection zone, confining zones, the relationship to nearby underground sources of drinking water, TDS value of water in the aquifer, other relevant justifications for the exemption.

- b. A completed Aquifer Exemption Evaluation (available on website)
 - i. Information supporting answers to additional questions for consideration.
- c. A map of the desired Aquifer Exemption Area, which includes the following:
 - i. A legible title and legend, a scale bar with map scale, and north arrow.
 - ii. Oil and gas wells should be identified with an API number at minimum. Display the well status of each well.
 - iii. $\frac{1}{4}$ - mile buffer around the surface-hole location for vertical injection well(s) and bottom-hole location for directional injection wells. Show the QtrQtr section boundaries to delineate the total area to be exempted.
 - iv. Legible section lines and numbers.
 - v. All water wells located within $\frac{1}{2}$ -mile of the proposed exemption area with their depth of penetration.

Common Errors and Issues Encountered by ECMC Staff

- 1. Incomplete rationale explaining the sealing zone above and below the injection zone.
- 2. Incomplete rationale explaining the sealing zone integrity.
- 3. Incomplete rationale explaining other criteria requested on the Evaluation Form.

Appendix A – Rule 802 UIC AQUIFER EXEMPTIONS

802. UIC AQUIFER EXEMPTIONS.

b. Criteria for UIC Aquifer exemption. An UIC Aquifer or a portion thereof may be designated by the Director or the Commission as an exempted UIC Aquifer, in connection with the filing of an application pursuant to Rules 803, 808, 809 or 810, and after coordination with the Colorado Department of Public Health and Environment, Water Quality Control Division and U.S. Environmental Protection Agency, if it meets all of the following criteria:

- (1) It does not currently serve as an Underground Source of Drinking Water and it is not classified for domestic use by the Water Quality Control Commission;
- (2) The applicant demonstrates that it cannot now and will not in the future serve as a source of drinking water for one of the following reasons:
 - A. It is mineral, hydrocarbon, or geothermal energy producing, or can be demonstrated by a person filing an application pursuant to Rules 803, 808, 809, or 810 to contain minerals or hydrocarbons that, considering their quantity and location, are technologically feasible to develop and can be commercially produced; or
 - B. It is so contaminated that it would be economically or technologically impractical to render the water fit for human consumption.
- (3) The applicant demonstrates that it cannot now and will not in the future serve as a source of agricultural water for one of the following reasons:
 - A. It is mineral, hydrocarbon, or geothermal energy producing, or can be demonstrated by a person filing an application pursuant to Rules 803, 808, 809, or 810 to contain minerals or hydrocarbons that, considering their quantity and location, are technologically feasible to develop and can be commercially produced; or
 - B. It is so contaminated that it would be economically or technologically impractical to render the water fit for agricultural use.

c. UIC Aquifer Exemption Public Notice. If an UIC Aquifer exemption is required as part of an injection permit application process, the injection well applicant will apply for an UIC Aquifer exemption. This application will contain data and information that show the applicable UIC Aquifer exemption criteria set forth in Rule 802.a are met. After evaluation of the application and prior to designating an UIC Aquifer or a portion thereof as an exempted UIC Aquifer, the Director will publish a notice of proposed

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designation on the Commission's website and in a newspaper of general circulation serving the area where the UIC Aquifer is located. The notice will identify such UIC Aquifer or portion thereof which the Director proposes to designate as exempted, and will state that any interested person may request the Commission to hold a hearing.

- d. Evaluation of Written Requests for Public Hearing.** Written requests for a public hearing before the Commission will be reviewed and evaluated by the Commission to determine if the criteria set forth in Rule 802.a have been met. If, within 30 days after publication of the notice, the Commission receives a hearing request for which the Director determines the criteria set forth in Rule 802.b are met, the Commission will hold such a hearing pursuant to Rule 510. If no request for hearing is filed within 30 days, the UIC Aquifer or portion thereof will be considered exempted 30 days after publication of the notice.
- e. Submission to EPA.** If the Commission approves a UIC Aquifer exemption pursuant to Rule 802.d, the Director will promptly submit a formal request for approval of the exemption to EPA. A UIC Aquifer exemption is not effective until it receives final approval from EPA.